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6. High Functional 3D Human Model System for Dynamic Visualization of Locomotions

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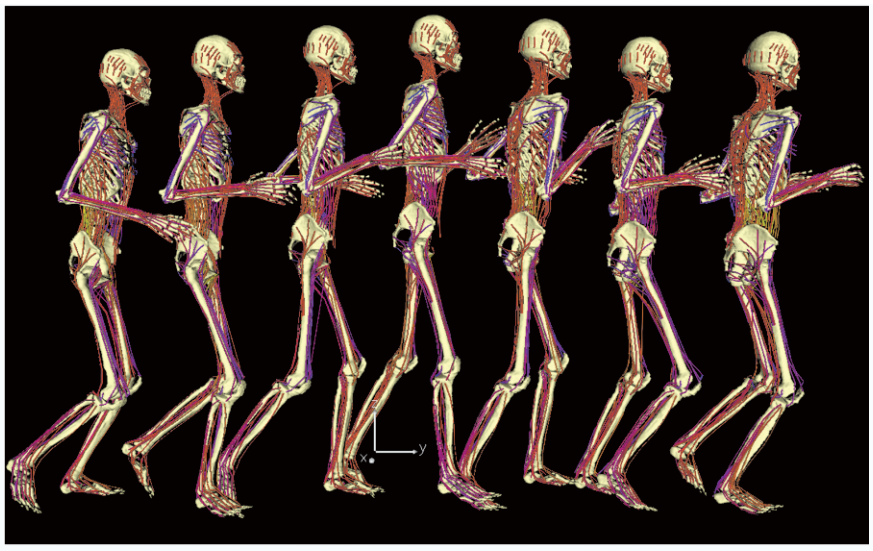

Development of the High-functional 3D Human Model System

We constructed a high-functional 3D human skeletal and musclar model system using 3D MRI data set of a whole human body. By modeling the joints of each skelton, this system allows us its spatial operation in real time. At the same time, such method made possible to operate a serial motion of multiple joints in the human model by providing a range of motion in each joint structure as a parameter. This whole human model itself was consisted of 151 parts of skeletons and 89 joints. In addition, we developed a technique of measuring a range of motion and a system to indicate a condition of motion for each joint using 8 Polhemus sensors. Next, a flexible string-typed muscle model was added to the skeletal model. All images in this type of muscle model can be operated in real time with its string shape to reduce an amount of calculation at the time of motion simulations. At last, having motion capture data using VICON system with multi video cameras to operate the model four dimensionaly, users can effectively recognize activities of the string-shaped muscle model as moving the skeleton. The figures show a 4D motion model of running slowly.